Willard Bay Settlement Request for Proposals

The Division of Water Quality is soliciting project proposals that will enhance and protect waterways and environmental areas that may have been affected or related to the March 2013 release of diesel in the Willard Bay State Park. Examples of acceptable mitigation projects include but are not limited to: environmental projects, infrastructure improvements, and studies or educational activities/events which serve the purpose of protecting or improving water quality and/or the ecology of natural systems. Proposals must include a detailed description of the mitigation project, a cost breakdown showing how the funds will be used, and a plan for implementation of the project. The implementation plan shall include a timeline for implementation, completion of the project, and submission of final document(s) verifying completion of the project.

A two phase process will be used to evaluate proposals and select projects for funding. The first phase will evaluate proposals submitted on the form included below and select projects for funding. Initial proposals should be limited to a six (6) page maximum. Supplemental documents such as letters of support, information to demonstrate previous project implementation and other relative supportive documents may be submitted in addition to the six (6) page application form. Successful applicants will then be notified to submit detailed project plans in the second phase. Upon approval of the detailed project implementation plans, funding will be authorized by the Director of the Utah Division of Water Quality.

The deadlines for proposal submission, detailed project plans and funding authorization are provided here:

- May 5, 2014, 5:00 p.m.: Submission Deadline for project proposals
- May 28, 2014: Projects selected, funds allocated, & Proposers notified (Accepted proposals will be posted on DWQ website.)
- January 1, 2018: Completion of project and final reports due

The following criteria must be met by each funded project:

1. Proposed project must enhance the natural environment by improving conditions for one or more of the following: wildlife, habitat, native vegetation, water quality or emergency response or provide scientific and/or educational enhancements to the citizens of Utah in the context of the above named environmental areas.
2. Proposed project must benefit Utah citizens by providing one or more of the following: enhancements of infrastructure, educational opportunity, environmental benefit or recreational opportunity.
3. Proposer must have either an interest in any land directly involved in the project (e.g., fee title, easement, or other legal agreement that gives all needed rights to enhance the land involved in the project) or written permission/contract to conduct project activity on property.
4. Proposed project must be capable of being completed within 4 years.
5. Proposer must be capable of implementing the proposed project.

Proposals will be scored based upon the following criteria:

Strength of the Project

1. Project benefits the area within Willard Bay State Park or the ecosystems in close proximity.
2. Project benefits the natural environment.
3. Project increases the ecosystem services being provided by the enhanced waterway.
4. Project has social benefits.
5. Project size – how large is the total area that will be directly enhanced by the proposed project?
6. Project connectivity – how does the proposed enhanced project area connect to other natural areas or projects.
7. Project proposer can leverage additional funds.
8. Project cost-effectiveness.
9. Administrative expenses.

Strength of the project team

10. The proposer has the ability to carry out the project as shown by successful past experience in carrying out similar projects.
11. The proposer can ensure, through contract or other written agreement, long term maintenance (if applicable) will sustain the project into the future.
12. The project has multi-agency support and collaboration.

A completed proposal form, no more than six (6) pages, plus supplemental documents, must be submitted in hard copy or emailed electronically (preferred) by May 5, 2014 to the Division of Water Quality to the attention of:

Emily Bartusek
Division of Water Quality
PO Box 144870
Salt Lake City, UT 84114
ebartusek@utah.gov

UTAH DIVISION OF WATER QUALITY
195 North 1950 West
PO Box 144870
Salt Lake City, Utah 84114-4870

Willard Bay Project Proposal Form

NOTE: Proposal must be no longer than 6 pages. Supplemental documents such as letters of support, information to demonstrate previous project implementation and other relative supportive documents may be submitted in addition to this form.

Applicant Name: Tyler van der Stappen

Co-Applicant Name(s) (if applicable): _____

Project Title: High Uinta Mycology Exploration

Agency or Business Name (if applicable): HUME

Mailing Address: 1050 Creekside Dr _____ City: Ogden State: UT Zip: 84404

Phone: (801 920 2403) - _____ E-mail: soundmanrecording@hotmail.com

☐ Individual ☐ Non-Profit ☐ Govt. Agency ☒ Academic ☐ Commercial ☐ Other

1. Estimated Project Costs:

Labor	$ 1k	
Materials	$ 2k	(website, literature pressing, promo's)
Equipment	$ 2k	(microscopes, culture sample equipment)
Administration	$ 1k	(help cover time needed to establish HUME)
Miscellaneous	$ 4k	(fuels, fee's, waivers set up, etc)
TOTAL	$ 10k	

Other sources of project funding:

s e l f	$ 3 k	_____	$
Source	Amount	Source	Amount
_____	$	_____	$
Source	Amount	Source	Amount
_____	$	_____	$
Source	Amount	Source	Amount
_____	$	_____	$
Source	Amount	Source	Amount

Total project cost including other sources of funding: $ 13k
(please include bids for labor, equipment, rentals, etc.)

2. Describe the purpose and need of the project: High Uinta Mycology Exploration is a field guided tour experience that aimes to share the a very little known secret about Utah..."world class mushroom hunting we have right here" for beginners and amatuer mycologist and help to give understanding of how vital fungi are to our ecosystem and for cleaning up toxins and regenerating soils. Also safely learning fungi identification will be vital emphasis. Once established HUME will self perpetuate and be self funded through field guide fees/donations, the goal will be educational and to help establish the known worth of the Uinta Mountains as the world class myco destination that it is. We will base our framing off of Paul Stamets passionate mycorestoration work and accomplishments.
3. Estimated time frame of the project with significant milestones (Note: Project must be completed

2014- Est HUME w/Website, obtain equipment, promote, First Expedition for beginners Aug 2014!
2015- Publish research on website and findings continue with several weekend and longer expeditions
2016-Publsih research on website, continue expedtion, collaborate with Utah Mycology Association
2017-Publish research on website continue expeditions collaborate with Utah Mycology Association
2018 Submit final report and demonstrate how HUME is fully operational, self funded and continuing on with its mission statement for many years to come and growing attention to the Uintas World Class mushroom scene!

4. Describe the location of the project with attached location map, including details on the total area that will be directly enhanced by the project: Uinta Mountain Range, Uinta National Forest, UT
5. Describe how the project will specifically enhance and protect waterways affected by the Willard Bay diesel release and improve the conditions of one or more of the following: wildlife, habitat, natural vegetation, water quality or emergency response: By learning about mycelliums ability to clean up toxins and view them so densely in one area (the Uintas) the inspiration to use them in many ways is unprecidented and will help people understand how valuable of an asset fungi are to our eco system and cleaning it up.
6. Describe project's connectivity to other natural areas or projects that further enhance wildlife, habitat, natural vegetation, water quality or emergency response: Recreational & educational experience ties these together
7. Describe any additional social benefits of implementing this project: Learning opportunities, interaction, and UT recreation
8. Project plans and details, including rights to work on specified piece of land: Not needed, just fee's pass.
9. Describe your experience in implementing projects of similar scope and magnitude: Taught beginning mycology to several people on personal basis. I have been very well studied and I have studied with Paul Stamets personally.
10. Describe how ongoing maintenance of the project will be funded and carried out: through guide fee's/donations, I will personally be guiding expeditions to Uinta's in peak season and throughout open season, from day long to weeks long field expeditions. Utah Mycology Association will collaborate with HUME to host guided expeditions and advance the study of mycology and further garner interest.
11. List consultants or agency partners that have participated in project development (below):

Name/Company Fungi Perfecti (Paul Stamets Co.) Address PO Box 7634 • Olympia, WA 98507 360-426-9292

Name/Company Utah Mycology Association Address 1148 Sunnyside Ave. Salt Lake City, UT 84102-3726

Name/Company Address Phone

Signature _____ Date 4.26.14

Applicant

Signature _____ Date _____

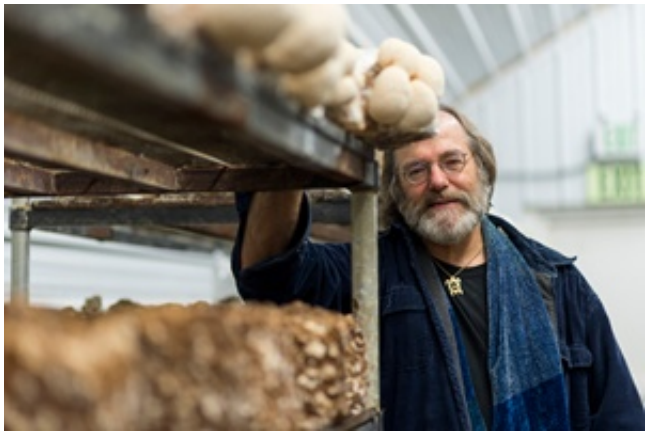
Co-Applicant (if applicable)

most ardent scientific evangelist is the man ahead of us. Stamets is trying to find a patch of chanterelles, a variety known for its exquisite flavor. But the species that stop him in his tracks, and bring a look of bliss to his bushy-bearded face, possess qualities far beyond the culinary.

He points to a clutch of plump oyster mushrooms halfway up an alder trunk. "These could clean up oil spills all over the planet," he says. He ducks beneath a rotting log, where a rare, beehive-like Agarikon dangles. "This could provide a defense against weaponized smallpox." He plucks a tiny, gray *Mycena alcalina* from the soil and holds it under our noses. "Smell that? It seems to be outgassing chlorine." To Stamets, that suggests it can break down toxic chlorine-based polychlorinated biphenyls, or PCBs.

Most Americans think of mushrooms as ingredients in soup or intruders on a well-tended lawn. Stamets, however, cherishes a grander vision, one trumpeted in the subtitle of his 2005 book, *Mycelium Running: How Mushrooms Can Help Save the World*. Mushroom-producing fungi, he believes, can serve as game changers in fields as disparate as medicine, forestry, pesticides and pollution control. He has spent the past quarter-century preaching that gospel to anyone who will listen.

If his data were less persuasive, he might be dismissed as an eccentric myco-utopian. Stamets has no regular academic or institutional affiliation; his research is funded mostly by the profits from his private company, Fungi Perfecti, which sells gourmet and medicinal mushrooms (along with growing kits, mushroom-derived supplements and mushroom-related books and knickknacks) by mail order and at health food stores.



Paul Stamets shows off mushrooms in a growing room at Fungi Perfecti, his family business and farm. Work done there has inspired potential solutions to such global problems as radioactive waste, global warming, oil spills and cancer.

Stuart Isett

With his Woodstockian hirsuteness and frank enthusiasm for mushrooms of the psychoactive sort, Stamets often comes across more as a hippie mystic than a dispassionate scientist. "Our bodies and our environs are habitats with immune systems," he writes in *Mycelium Running*, and fungi "are a common bridge between the two." He describes mycelium, the web of fibrous tissue from which mushrooms spring, as "the neurological network of nature," a "sentient membrane" that has "the long-term health of the host environment in mind." To some, such language seems uncomfortably metaphysical.

Yet Stamets' ideas have gained an expanding audience among mainstream scientists, environmental engineers, federal officials and Silicon Valley investors. His 2008 talk at the TED Conference, the annual hajj of tech barons and thought leaders, has snagged more than 1.5 million hits since it was posted online; it also earned Stamets invitations to brainstorming sessions with Bill Gates, Amazon CEO Jeff Bezos and the guys

Garden Giant mushroom: Mycelial wastewater filtration system and culinary delight.

Stuart Isett

In the lab, a white-rot mold called *Phanerochaete chrysoporium* had shown particular thoroughness at digesting oil, but it often failed to perform under outdoor conditions. The Enviros staff hoped to find a hardier fungus, and Stamets suggested they try oyster mushrooms (*Pleurotus ostreatus)*, an aggressive white-rotter that could grow practically anywhere. He sent them some oyster mushroom spawn. The technicians covered it with oil, most of which was consumed within three weeks; mushrooms were popping up through the muck. But Enviros went bankrupt before the work could proceed further.

Meanwhile, Stamets began installing experimental mycelial wastewater filtration systems for other farmers (eventually with funding from the county and the state), improving on his initial design by encasing *Stropharia* spawn and wood chips in burlap sacks and packing them into ditches placed to catch maximum runoff.

He began touting the method in environmental journals, and in 1996 he was approached by Pacific Northwest National Laboratory, operated by the Battelle Memorial Institute, known for technological solutions to energy and environmental issues. Although initial interest was in

Petroleum-eating oyster mushrooms resembling those above can remediate soil contaminated by oil spills.

Stamets' wastewater work, excitement grew when he mentioned his foray into oil-spill remediation.

Stuart Isett

Stamets and the Battelle team began lab work to maximize the mushroom's petroleum-eating efficacy. From his research on psilocybes, he knew that different strains of a single mushroom species can have wildly varying levels of chemical activity. So the team grew a few dozen strains of oyster mushroom, testing each for oil-digesting ability in petri dishes in the lab.

Growing room manager Justin Tulloss inspects Lion's Mane mushrooms (*Hericium erinaceus*) at Fungi Perfecti.

Stuart Isett

The strains that consumed oil fastest were selected for further trials, and in 1998, the team used the top performers in an experiment sponsored by the Washington State Department of Transportation at a maintenance yard in Bellingham. Soil at the site was contaminated with diesel fuel at up to 20,000 parts per million, similar to concentrations on Alaskan beaches after the Exxon Valdez oil spill. That spring, WSDOT scooped out four piles of dirt. Stamets' team added layers of myceliated wood chips to one pile and covered it with a shade cloth. Two of the piles were treated only with bacterial cultures or chemical fertilizers. One pile was left as a control.

Four weeks later, the myceliated sample was light brown, sweet-smelling and bursting with mushrooms — some more than 12 inches in diameter. Insects came to eat the fungi, and their larvae attracted birds, which likely deposited seeds. After nine weeks, the pile was covered with flourishing plants. Aromatic hydrocarbons

had dropped to less than 200 ppm, suitable for freeway landscaping.

"The other piles," Stamets recalls, "remained dead, dark and stinky."

The mushrooms had won.

Ants succumb to the pesticide power of green *Metarhizium* fungus, grown in the petri dish at right and disguised as food.

Paul Stamets

How Mushrooms Can Save the World

By then, Stamets was obsessed with the possibilities of what he called "mycorestoration," a nascent field encompassing his own and other researchers' work in mycofiltration, mycoremediation, mycoforestry and mycopesticides (most of which are terms he coined). He began amassing a genetic library of hundreds of mushroom strains — gathered on hikes through the old-growth forests of the Northwest and on trips to Europe, Asia, South America and Australia — that could be used for environmental as well as medicinal healing.

The EPA asked Stamets to help the Coast Guard find ways to clean up waterborne oil spills. In response, he invented the mycoboom, a burlap tube filled with oyster mushrooms designed to break down petroleum while floating on a slick or barricading a beach. Battelle researchers tested his fungal strains against neurotoxins and found one potent variety of psilocybin mushroom highly effective at breaking down VX nerve gas.

Stamets collaborated with the Washington State Department of Natural Resources on another successful field experiment, planting mushrooms on old logging roads to prevent silt and pollutants from clogging streams. He improved crop yields on farms and sped up reforestation in woodlands by adding mycorrhizal